THE EU MARKET FOR PASSION FRUIT

Market Survey #05

INTRODUCTION

Passion fruit (*Passiflora edulis*) is widely enjoyed in producing countries in Africa, Latin America and Asia, where the fruit is commonly processed into juice and other products. In Kenya, it is one of the most important tree fruits and is mainly grown by smallholder farmers in various regions throughout the country. Passion fruit may be eaten fresh, but mostly the pulp is extracted and preserved by heating or cooling. The juice has a unique and intense flavor and high acidity which makes it a natural concentrate. When sweetened and diluted it is very palatable and blends well with other fruit juices. Typical processed products are ice cream, sherbet, nectar, juices, concentrate, squash, jams and jellies. In addition, *Passiflora* plants are often cultivated as ornamentals for their showy flowers.

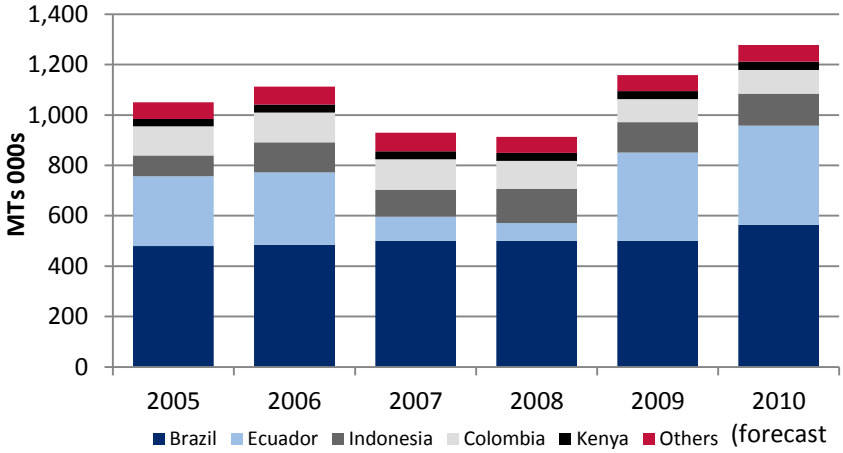
Within this species, there are two distinct forms, the standard purple, and the yellow, distinguished as *P. edulis f. flavicarpa*. The yellow form has generally larger fruit than the purple, while the pulp of the purple is less acidic, richer in flavor and typically has a higher proportion of juice over the yellow. Regardless, both types of passion fruit make excellent juice blends.

The purple passion fruit is the predominant of the two in Kenya with highest production in the Rift Valley region followed by the Upper Eastern highlands (together constituting more than 74% of national production). New varieties of the yellow passion fruit are gradually being introduced to farmers especially in the lowlands of the coastal region targeting smallholder commercial production for fresh consumption and processing.

PRODUCTION

According to a FAO report published in 2011, world production of passion fruit increased from approximately 1.05 million MTs in 2005 to 1.15 million MTs in 2009. The FAO forecasted[1] that global production would total 1.27 million MTs in 2010. Brazil is the largest producer of fresh passion fruit, but domestic demand is such that the country imports juice concentrate from other countries, such as neighboring Ecuador.

Figure 1: World Production of Passion Fruit, 2005-2010



Source: Intergovernmental Group on Bananas and Tropical Fruits, FAO, 2011

After Brazil, Ecuador, Indonesia and Colombia are the next largest producers of fresh passion fruit. However, Ecuador is plagued by boom and bust cycles owing to weather-related production problems such as the heavy rains that drastically reduced supply in 2008 and 2009. Peru is also a producer of recent significance as it has developed competitive export industries, especially for processed concentrate. In Africa, producers of the wrinkly purple variety include Kenya, South Africa and Zimbabwe, with Kenya leading the region in both production and trade. Passion fruit production in Kenya has grown from 53,396 MT in 2005 to 104,437 MT in 2010, however, production for 2011 is expected to reach 122,362MT (MOA and HCDA). Most of the passion fruit produced is consumed in the domestic market as fresh fruit. However a significant proportion is utilized either as fresh juice through household extraction and microprocessing in the catering industry or by processors for manufacturing of juice products.

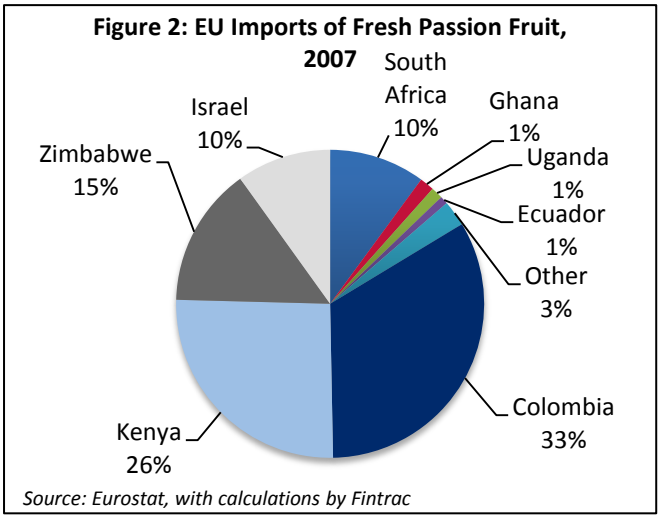
[1] The FAO's production figures for 2010 were forecasted using Compound Annual Growth Rate, an average growth rate over a period of several years. It is a geometric average of annual growth rates, as opposed to the arithmetic average (Moneyterms UK, 2011).

MARKETS

Kenya has the capacity to produce passion fruit all-year-round, but due to heavy reliance on rain-fed production the market is highly influenced by seasonality. Presently, the regional market absorbs the bulk of Kenyan passion fruit exports, with Uganda as the dominant market destination. The international market for fresh passion fruit is envisioned to grow as consumers globally reach for new and more exotic fruit. Trade statistics show that the largest importer of tropical fruits in general is the US, followed by EU, Japan and China. The largest market for fresh exotic fruit in Europe is the United Kingdom, with imports valued at $473 million in 2009. Passion fruit's share of that market is estimated at around 1 percent (or $8.7 million).

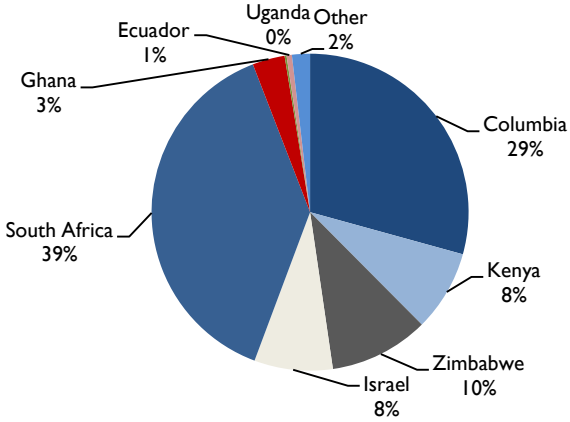
According to a 2008 report published by CIRAD, a French agricultural research organization, most of the quantity sold on the European markets consists of purple variety and are shipped mainly from East and southern Africa (Kenya, Zimbabwe, South Africa, etc.) and Colombia. These imports enter through Belgium, France, UK, Italy, with additional volumes received from transshipment points such as the Netherlands and Spain.

Figure 2: EU Imports of Fresh Passion Fruit, 2007



Source: Eurostat, with calculations by Fintrac

Figure 3: EU Imports of Fresh Passion Fruit and Lychee 2010



The most reliable **EU** trade data for fresh passion fruit is reflected in the Eurostat harmonized schedule (HS) classification of "fresh passion fruit, carambola and pitahaya", which were utilized through 2007 only. Eurostat data from 2008 onwards also include a variety of other tropical fruits, and is therefore of little practical use. Despite these difficulties, Fintrac estimates[2] fresh passion fruit imports to be around 4,000 MTs, valued at $18 million in 2007, up from an estimated 2,000-3,000 MTs in 2005-2006. From 2006-2008, EU imports increased steadily, with a slight drop in 2009, consistent with weather related supply limits and the overall drop in produce demand worldwide during the 2008/2009 economic downturn.

SUPPLIERS

Brazil is the largest producer of passion fruit in the world, but is not an exporter of significance due to the high percentage of domestic consumption. According to the Brazilian Fruit Institute (IBRAF), Brazil produced 664,286 MTs of fresh passion fruit in 2007 and 718,798 MTs in 2009. In 2009, the top regional Brazilian producers were the northeastern states of Bahia and Ceará, which produced 322,755 MTs (45 percent total production) and 129,001 MTs (18 percent), respectively. Northeastern Brazil is a fertile growing region as its harvest period lasts 10 to 12 months, while southeastern Brazil has a harvest period of eight months. In general, Brazilian peak harvest seasons occur in April, as well as from October to November.

Brazil has long had a well-established passion fruit industry with large-scale juice extraction plants. Yellow passion fruit accounts for 95 percent of production and is primarily used for juice processing. Purple passion fruit accounts for the remaining 5 percent and is sold in the fresh fruit market due in part to its low acidity.

Ecuador is a major producer and one of the largest global exporters of processed passion fruit. According to Ecuador's National Institute of Statistics and Census, Ecuador produced 96,319 in 2007 and 65,776 MTs in 2009. Most of Ecuador's production goes into juice processing. An industry source stated that Ecuadorian passion fruit juice

[2] Fintrac estimates for EU fresh passion fruit imports are primarily based on Eurostat data taken from CN8 *08109040* "Fresh Passion Fruit, Carambola and Pitahaya" (Valid: 1995-2007) and CN8 *08109020* "Fresh Tamarinds, Cashew Apples, Lychees, Jackfruit, Sapodillo Plums, Passion Fruit, Carambola and Pitahaya" (Valid: 2008-Present). Only established and well-known fresh passion fruit exporters were analyzed. In addition, special consideration was taken with South Africa and Israel as they are also major exporters of lychees to the EU market.

and concentrate exports totaled US$60.4 million (FOB) in 2007, while fresh fruit exports were just US$100,000.The source also noted that the country primarily produces purple passion fruit since it keeps better than the yellow variety and tastes better (due to lower acidity).

According to the Ecuador's Corporation for the Promotion of Exports and Investments (CORPEI), Ecuadorian passion fruit juice and concentrate exports totaled 18,000 MTs in 2008, with the EU (primarily the Netherlands) and US capturing 70 percent and 18 percent of exports, respectively. In general, peak harvest periods occur from March to April and from November to December.

Indonesia is a large producer of passion fruit or *markissa* as it is locally known, but is not a significant exporter of juice. According to Indonesia's Ministry of Agriculture, 106,788 MTs were produced in 2007 and 120,796 MTs in 2009. Indonesian passion fruit is primarily grown in South Sulawesi, central Indonesia, where there are two peak periods of production (July-August and December-February). Almost all of the production is destined for the processing sector, which is largely concentrated in Makassar, South Sulawesi.

Colombia is a large producer, as well as a major supplier of purple and yellow passion fruit to the EU market. According to Colombia's Ministry of Agriculture and Rural Development, the country produced 121,132 MTs in 2007 and 94,014 MTs in 2009. The country is the largest single exporter of fresh passion fruit to Europe with 1,338 MTs exported in 2007, valued at $6.6 million. Fintrac estimates volumes of around 1,881 MTs in 2009, based on estimated proportion of passion fruit production to other tropical fruits in the same export category. Peak harvest periods occur in January and from June to July.

Kenya is a minor producer by global standards but with significant exports of fresh fruit to Europe and strong sales to regional markets. National production was reportedly 39,800 MTs in 2009 (Kenyan Ministry of Agriculture) with more than 90% purple types (Fintrac). According to the Kenyan Revenue Authority, from 2006 to 2010, passion fruit export volumes increased from 1,651 MTs to 2,634 MTs, while values (FOB) increased from US$1.66 million to US$1.84 million. Uganda accounted for 76 percent of passion fruit exports in 2010, followed by the EU and Middle East at 17 percent and 5 percent, respectively.

Peru is fast becoming a leading producer and international exporter of passion fruit juice (i.e. fresh juice and concentrate). According to a major Peruvian beverage bottler, from 2005 to 2010, Peruvian passion fruit juice exports increased from 1,897 MTs to 9,330 MTs, with an estimated 10,900 MTs expected in 2011. According to Peru's Macro-Regional Association of Export Producers (AMPEX), in 2010, 3,535 MTs or 89 percent of the country's passion fruit concentrate exports were shipped to the Netherlands (US$18.2 million – FOB). Also in 2010, 3,320 MT or 64 percent of the country's passion fruit juice (i.e. pure juice) exports were shipped to the Netherlands (US$5.3 million – FOB). Puerto Rico was second with 1,293 MTs or 27 percent of exports (US$5.3 million – FOB).

The most recent available information for Peruvian passion fruit production is from an AMPEX report which stated 17,455 MTs was produced in 2005. The primary destination for Peruvian fresh passion fruit exports in 2010 was Italy at 12.5 MTs or 76 percent of total fresh exports (US$21,600 – FOB). Canada was second with 8.9 percent of exports totaling 1.6 MTs (US$2,524 – FOB). Peak harvest periods for passion fruit occur from July to September.

PRICES

The most reliable international price data on processed passion fruit comes from the International Trade Center's Market News Service (ITC-MNS), which primarily focuses on passion fruit juice from Brazil, Ecuador and Peru. ITC-MNS price data differentiates between "Not-From-Concentrate" (NFC) juice and "Frozen Concentrate" (FC). According to the FAO, NFC juice is a product that is the closest match to fresh juice in a convenient ready-to-serve package, whereas FC must be reconstituted with water. In addition, the ITC-MNS price data differentiates between "brix" or sugar content of the pulp. Note that one degree brix is equivalent to one gram of sucrose in 100 grams of solution, and represents the

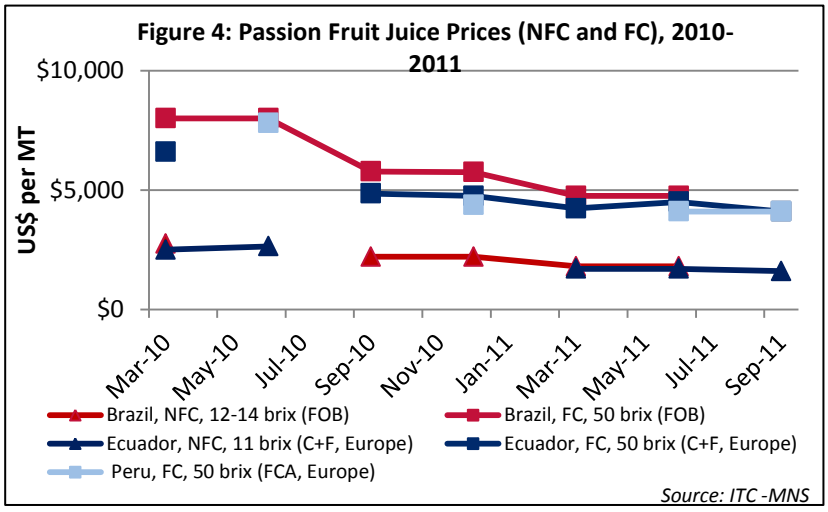
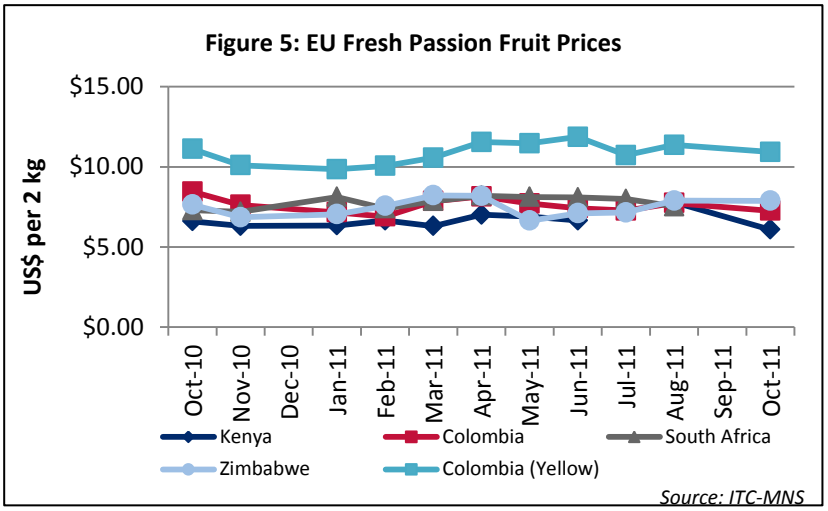


Figure 4: Passion Fruit Juice Prices (NFC and FC), 2010-2011

strength of the solution (as a percentage of weight). Lastly, the price data is given in FOB, FCA and C+F[3] international commercial terms.

There is a positive relationship between price and brix level. The price of Brazilian 12-14 brix NFC (FOB) decreased from US$2,750 to US$1,800 per MT from March 2010 to June 2011. The price of Ecuadorian 11 brix NFC (C+F, Europe) decreased from US$2,500 to US$1,600 per MT from March 2010 to September 2011.

The price of FC passion fruit juice has also declined over the same period. Brazilian 50 brix FC (FOB) decreased from US$8,000 to US$4,750 per MT from March 2010 to June 2011. Ecuadorian 50 brix FC (C+F, Europe) declined from US$6,600 to US$4,100 per MT from March 2010 to September 2011. In addition, Peruvian 50 brix FC (FCA, Europe) declined from US$7,800 to US$4,100 per MT from June 2010 to September 2011. Despite falling prices, juice industry experts expect prices to increase in 2012 due to increasing on-farm and post-harvest production costs (ITC-MNS, 2011).



ITC-MNS also provides EU wholesale price data for fresh purple passion fruit, as well as yellow passion fruit from Colombia. From October 2010 to October 2011, Kenyan purple passion fruit prices ranged from US$6.08-US$7.08 per 2kg, while South African and Zimbabwean prices ranged from US$7.19-US$8.20 and US$6.63-US$8.22 per 2 kg, respectively. Over the same time period, Colombian purple passion fruit ranged from US$6.90-US$8.45 per 2kg, while Colombian yellow passion fruit ranged from US$9.84-US$11.86 per 2kg. Countries with better quality fruit enjoy higher pricing in the international market.

STANDARDS, LAWS AND REGULATIONS

Tariff and Trade: EU fresh passion fruit imports have a zero percent tariff on fresh passion fruit imports. Passion fruit juice imports from Kenya also have a 0 percent tariff rate due to the interim Economic Partnership Agreements (EPA) that was signed in 2007. EPAs are a scheme to create a free trade area (FTA) between the European Union and the African, Caribbean and Pacific (ACP) group of countries.

Grades and Standards: Size, shape, skin color, acidity and SSC (Soluble Solids Content or pulp content) are the major criteria used to evaluate quality of fresh passion fruit. According to the US National Bureau of Standards, fresh passion fruit is classified into three grades defined below:

> Grade 1 – The passion fruit must be of the highest quality. The fruit shall be firm with a shiny appearance, absent of any signs of shriveling, free from visible evidence of insects, disease, and surface blemishes.
>
> Grade 2 – The passion fruit must be of good quality, although 10 percent of the fruit in this grade may be soft or show signs of shriveling, and not have a glossy appearance.
>
> Grade 3 – The passion fruit do not qualify for inclusion in the higher grades, but should be clean, mature, free from pests and disease, and have similar color, shape, and size. Passion fruit with surface scarring and slight decay is not suited for import. Lastly, the fruit should have a minimum of 75 percent of the surface area colored to type (i.e. yellow or purple)

Packaging: Fresh passion fruit should be packed in strong, well-ventilated containers capable of being stacked without damaging the fruit. The fruit surface should be free of moisture before packing. In addition, only fruit of the same size category and stage of ripeness should be packed in the same carton. For juice concentrate it is often packaged into plastic bags and drums. An Ecuadorian firm noted on their website (December 2011) that it packages passion fruit concentrate in 200 liter (~53 gallon) drums.

[3] FOB or Free on Board applies to maritime trade where the price does not include the shipping costs to the port of destination. FCA or Free Carrier applies to air trade where the price does not include transport costs to the destination airport. C+F or Cost and Freight applies to maritime trade where the price includes shipping costs to the destination port. As a general rule, FOB and FCA prices should be lower than C+F since the latter includes shipping costs (Export Insurances Inc.)

Post-harvest Handling: Harvested passion fruit is typically transported to the processing plant where it is screened, inspected, and washed vigorously with high pressure water jets. Once cleaned, the fruit is passed to a final selection table where it is inspected and cleared for the juice extraction process. Specially designed extractors break down the fruit making it ready for processing and concentration. The flavor of the juice is sensitive to heat, making preservation by freezing preferred. According to an US company that markets Ecuadorian juice, the yield for processing 1 MT of 50 brix concentrate is 12:1. (i.e. 12 kg of fruit to make 1 kg of concentrate).

OUTLOOK

According to a FAO report published in 2011, global production of fresh passion fruit was forecasted to increase from 1.15 million to 1.27 million MTs from 2009 to 2010. In 2011, a decline in production is expected due to a drought in Ecuador that resulted in a 40 percent crop loss. A large number of Ecuadorian vines are at the end of their two year life cycle, implying another potential supply constraint. Growers will have to decide whether to replant or switch to alternative crops such as palm oil, cocoa or maize. Growers are increasingly under pressure to pursue other economic opportunities with passion fruit juice production costs increasing US$1,500 per MT from 2010-2011[4]. Whether growers switch or not, supply will likely be tight in 2012 with a nine month delay in new fruit harvests.

A tightening of supply will trigger an increase in passion fruit prices throughout the remainder of 2011 and into 2012. According to an October 2011 article from FoodNews, 50 brix FC juice has increased to US$4,500 per MT (ex-warehouse Rotterdam) and is expected to jump to US$5,500 per MT by March 2012 and possibly as high as US$6,000 per MT by the end of 2012. It remains to be seen whether Peruvian juice exports, which were forecasted to be 10,900 MTs in 2011 (16 percent increase from 2010), will offset Ecuadorian losses and mitigate price increases.

The EU market for fresh passion fruit has seen an increase in imports in recent years due to rising demand from ethnic markets and growing awareness of the fruit's health benefits. In addition, tropical fruit marketing campaigns are widely reported to be driving growth in the exotic fruit subsector. Consumption of tropical fruit including mango, papaya, passion fruit and avocado has increased slowly but steadily in recent years, and is expected to continue upward in the near to long term.

OUTLOOK FOR KENYA

Uganda continues to be the single largest export destination for Kenya's fresh passion fruit. However, in 2010 exports to Uganda declined by 17% from 2009 figures which is attributed to shortage in production and increased domestic consumption. In 2010, Kenya exported 779 MT of passion fruit to the EU constituting 8%of the import market (figure 3). The Kenyan passion fruit share of the EU market has declined significantly over the years (from 51% in 2005). This is mainly attributed to interceptions at point of entry due to pesticide residues, diseases such as woody virus, and general deterioration in product quality.

Given the increasing demand of passion fruit locally, regionally and in international markets there is a clear opportunity to increase domestic production. The ongoing interventions to train farmers in good agricultural practices, establish certified nurseries and subsequent propagation of clean planting material, form a basis for expanding production. Investments in irrigation technologies will provide the smallholder farmers with opportunities for year-round production as well as facilitate increased hectarage due to new production areas especially in semi-arid lands. Various opportunities give Kenya comparative advantages in terms of in-built production experience, favourable climatic variation, well-devoloped cold storage facilities, current investments in transport infrastructure which will help improve efficiency in the market channels and existing presence in the international market. However, for these opportunities to be exploited the issues of quality standards, disease control and pesticide residues need to be addressed with each industry stakeholder having a role to play. An ongoing ban and public awareness of dimethoate use on fruits and vegetables is one intervention at policy level that aims at reducing product interceptions in the EU market. The impact of the ban is expected to boost the buyers' confidence in Kenyan products as well as reduce risks that exporters are exposed to in out-sourced production hence presenting potential for export growth.

[4] Price report from ITC, June 2011

REFERENCES

1. FAO, Committee on Commodity Problems, Intergovernmental Group on Bananas and Tropical Fruits, 5th Session, Yaoundé, Cameroon, 3 – 5 May 2011, Tropical Fruits Compendium
   http://www.fao.org/docrep/meeting/022/am481t.pdf
   http://www.fao.org/economic/est/est-commodities/bananas/meetings-on-bananas-and-tropical-fruits/5ba-tf/en/
2. "Passion Fruit Passiflora edulis (Passifloraceae)" October 2008, FruiTrop, CIRAD
   http://passionfruit.cirad.fr/index.php/download/%28id%29/3899/%28langue%29/eng/%28type%29/article
3. "Produção brasileira de maracujá em 2009" Mandioca e Fruticultura, Embrapa (Regional Passion Fruit Production in Brazil)
   http://www.cnpmf.embrapa.br/planilhas/Maracuja_Brasil_2009.pdf
4. "Maracuja" Executive Commission for Cocoa Crop Planning (CEPLAC), Brazil
   http://www.ceplac.gov.br/radar/maracuja.htm
5. "Maracuyá ecuatoriano: La fruta de la pasión calma la sed de los holandeses" Blogs Universidad de Las Américas, Ecuador; July 7, 2008
   http://blogs.udla.edu.ec/negociosinternacionales/2008/07/07/maracuya-ecuatoriano-la-fruta-de-la-pasion-calma-la-sed-de-los-holandeses/
6. "Report On Passion Fruit Demand Study Indonesia" Prepared for IFC World Bank SADI; November 10, 2007
   http://www.capas.unpad.ac.id/penelitian/file/3bf79737242973f720135a606599e41f/Final%20Report%20MARKISSA%20Demand%20Study-Englsih%20Version.pdf
7. "Adding Value to Passion Fruit Production" Australia Indonesia Partnership, ACIAR–SADI Update 2.5; April 2009
   http://aciar.gov.au/files/node/10629/ACIAR-SADI_UPDATE_2.5_v3.pdf
8. Agricultural Statistical Database (BDSP), Republic of Indonesia, Ministry of Agriculture
   http://aplikasi.deptan.go.id/bdsp/newkom.asp
9. "The Potential for Passion Fruit in Eastern Indonesia" SADI-ACIAR Research Report, Australian Government; April 2008
   http://aciar.gov.au/files/node/8511/Final%20report%20SMAR-2007-197%20Part4.pdf
10. "The Passion Fruit Market – Is it Controllable?" Ulrich M. von der Linden, Carrière GmbH – Committed to Taste; January/February 2007
    http://www.carriere.de/fileadmin/Downloads/Passionfruit_Market.pdf
11. "Boletín 2010-IV" Asociación Macroregional de Productores para la Exportación (AMPEX), Peru; 2010
    http://www.ampex.com.pe/biblioteca.php?sw=bol_infor
12. "Maracuyá Pierde su Fuerza Exportadora" HOY Noticias del Ecuador y el mundo, December 16, 2009
    http://www.hoy.com.ec/noticias-ecuador/maracuya-pierde-su-fuerza-exportadora-382570.html
13. "De Maracuyá – 2006" Perfiles de Productos Asociación Macroregional de Productores para la Exportación (AMPEX), Peru; October 2006
    http://www.ampex.com.pe/servicios.php?sw=perfiles_com/lista_perfiles
14. "Citrus Juice Production and Fresh Market Extension Technologies" FAO; 2000
    http://www.fao.org/DOCREP/003/X6732E/x6732e08.htm#5
15. "Passion Fruit" Department of Tropical Plant and Soil Sciences, University of Hawaii at Manoa, Honolulu, HI
    http://www.ba.ars.usda.gov/hb66/104passion.pdf
16. "Passion Fruit" Post-Harvest Care and Market Preparation, USAID; January 2004
    http://pdf.usaid.gov/pdf_docs/PNACY830.pdf
17. "Products" Ecuador Passion Fruit; 2007
    http://www.ecuadorpassionfruit.com/prods_ing.htm
18. "Passion Fruit Juice" iTiTropicals; 2011
    http://www.passionfruitjuice.com/processing.php?MENU=6
19. "Incoterms" Appendix A, Export Insurances Inc.1999
    http://www.exportinsurance.com/incoterms.htm